REMARKS:

Claims 130, 131, 133-135, 140, 141, and 143 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,893,932 to Knollenberg. Some of the rejected claims have been amended and the rejection is traversed in so far as it is applied to the amended claims.

Claims 130 and 140 have been amended to clarify that the radiation from the beam is modulated as a function of time prior to its detection. This differentiates the rejected claims from Knollenberg. In the Office Action, the Examiner is of the opinion that the polarizing beam splitter 64 of Knollenberg constitutes the modulating device. The polarizing beam splitter 64 of Knollenberg, however, does not modulate radiation as a function of time. In Knollenberg's device, two separate beams, S-polarized beam and a P-polarized beam are directed separately to the same spot on the surface of the sample. Radiation scattered by the sample is collected by the same collection channel and the collected radiation is split into two detected beams by the polarizing beam splitter 64 into their respective S- and P-components. These components are then separately detected by means of detectors for detecting their respective intensities. The intensities so detected are then used in conjunction with calibration relationships (such as shown in Fig. 5 of Knollenberg) for measuring the scattering cross section of particles on or below the surface of a sample.

In a different embodiment of Knollenberg, instead of using a polarizing beam splitter, a dichroic beam splitter is employed where the two incident beams have different frequencies. Column 7, lines 10-14.

From the above it is clear that the only function performed by the polarizing or dichroic beam splitter 64 is for separating the light components from the two incidents beams. Where the two incident laser beams have different frequencies, the beam splitter does so by means by their different frequencies. Where the two incident beams have different polarizations, the beam splitter 64 does so by means of their different polarizations. Therefore, the beam splitter 64 does not modulate either the phase or the polarization of the collector radiation as a function of time, but merely separates the different components in the collector radiation by means of the different polarizations or frequencies.

It is believed to be well settled that in order for a reference to anticipate a claim, there must be identity of elements between those of the reference and those of the claim. Knollenberg clearly fails this test with respect to claims 130 and 140, since it does not teach or suggest modulating the radiation of the beam as a function of time prior to its detection by a detector.

As clearly explained by Knollenberg in column 6, line 24-36, the reason for employing two polarization (using S- and P-polarizations) measurements is such that "there are two calibration relationships from which to choose, and also there is a polarization ratio available ...," so that "it is possible to develop a monotonic calibration which is effected by using the 'S' polarization response for sizes up to about 0.4 μm and then switching to 'P' polarization responses for sizes larger than 0.4 μm. This type of 'polarization diversity' is utilized in the schematic of the invention shown in Fig. 6." This, according to Knollenberg, solves the problem illustrated in Fig. 4 of Knollenberg that where the response signatures are oscillatory and ambiguous. Column 6, lines 1-9.

In other words, by using two measurements rather than one (either based on polarization or frequency), it is possible according to Knollenberg to develop a monotonic calibration so that the scattering cross-section of the particles can be determined from a calibration relationship such as that illustrated in Fig. 5 of Knollenberg. The invention of the rejected claims, on the other hand, pertains to the measurement of sample characteristics that requires modulation of the interrogation radiation prior to detection as a function of time.

In view of vast differences between the above-described purpose and function and operation of Knollenberg's device and those of the rejected claims, it is clear that there is no reason or motivation for one of skilled in the art to modify Knollenberg's device so as to arrive at the features of the rejected claims. Therefore, it is further believed that the rejected claims 130 and 140 are non-obvious over Knollenberg.

Claim 144 has been added to more adequately cover the invention. For the same reasons as those explained above for 130 and 140, the limitation added by 144 is also not taught or suggested by Knollenberg.

Claims 131-135 and 141-143 are believed to be allowable since they depend from allowable claims. They are further believed to be allowable since they add limitations which are not taught or suggested by Knollenberg. Thus, claim 132 contains the limitation that one or more characteristics provided by the system comprise (s) film thickness, refractive index and/or surface roughness. Claim 142 contains a limitation similar to that of claim 132 discussed above.

We appreciate the Examiner's indication that claims 1-65, 67-129, and 136-139 are allowable over the prior art of record. We, however, disagree with the Examiner on her statement of reasons for allowance, as follows:

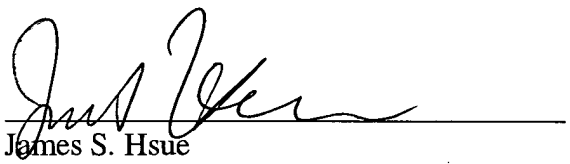
1. Claim 29 does not require the combination of a fixed or rotating polarizing element prior to the sample. Thus, a beam of polarized radiation having a linear polarized component may be provided without the use of a fixed or rotating polarizing element. For example, some radiation sources may provide radiation having a linear polarized component.

2. In claim 70, a rotating polarizing element and a fixed or rotating linear polarizer are employed and no rotating phase modulator is included in this claim. Furthermore, claim 70 does not require the derivation of parameters of the source, optics or modulator.

3. The Examiner's statement of reasons for allowance in regard to claim 80 is believed to contain be a typographical error, and is instead believed to be directed to claim 88 instead. We assume that this is the case.

Claims 1-65, 67-82, 88-144 are presently pending in the application. Reconsideration of the rejection is respectfully requested and an early indication of the allowability of all the claims is earnestly solicited.

Respectfully submitted,



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